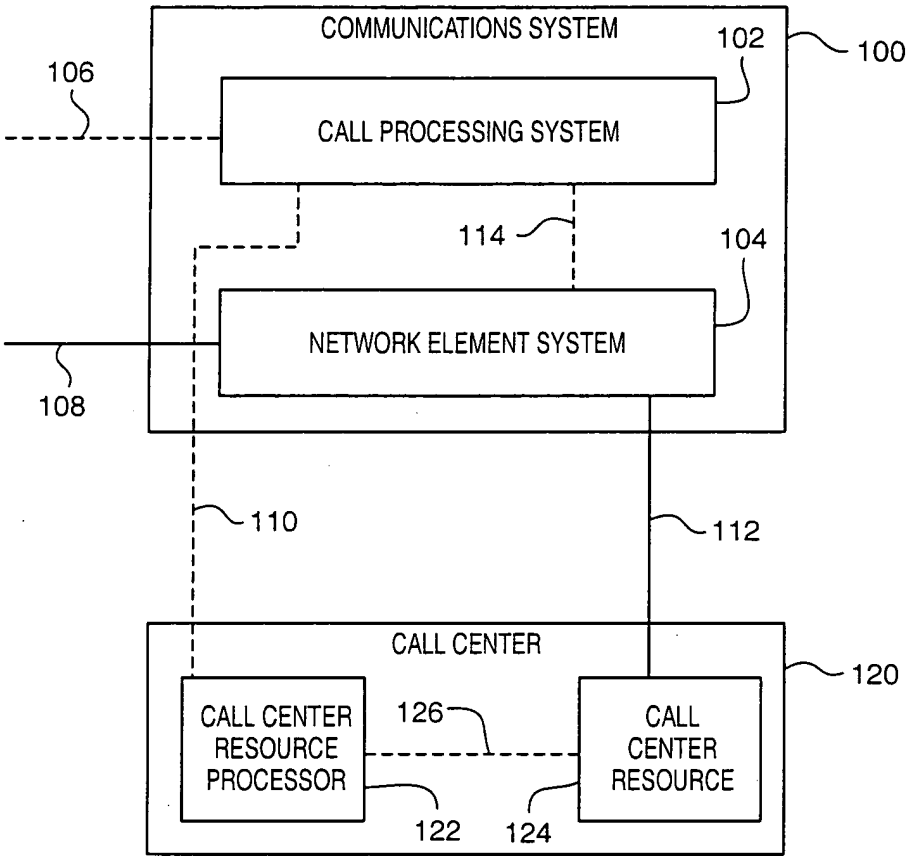
FIG. 1


COMMUNICATIONS SYSTEM
102
100
106
CALL PROCESSING SYSTEM
114
104
NETWORK ELEMENT SYSTEM
108
110
112
CALL CENTER
120
CALL CENTER RESOURCE PROCESSOR
126
CALL CENTER RESOURCE
122
124

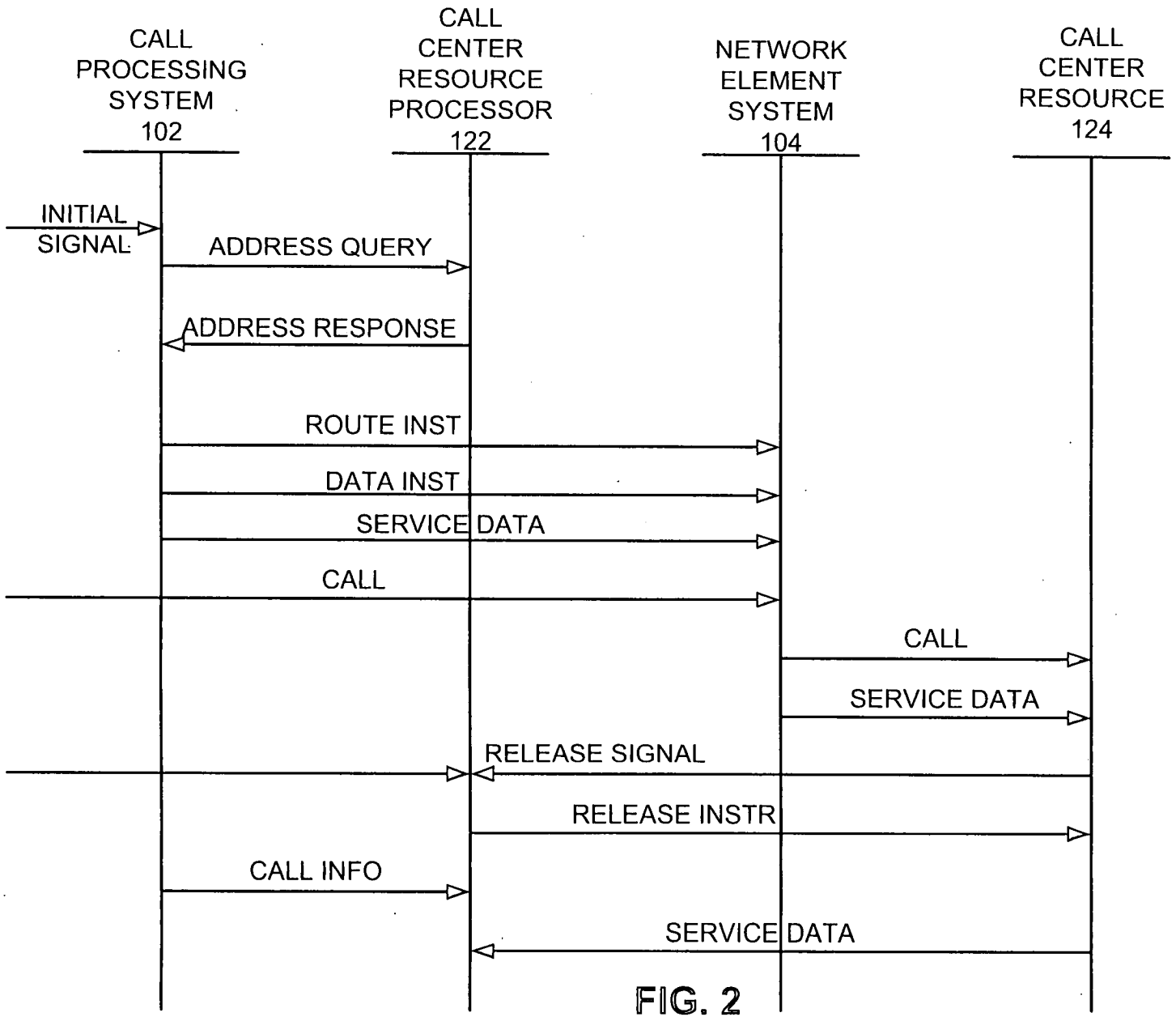
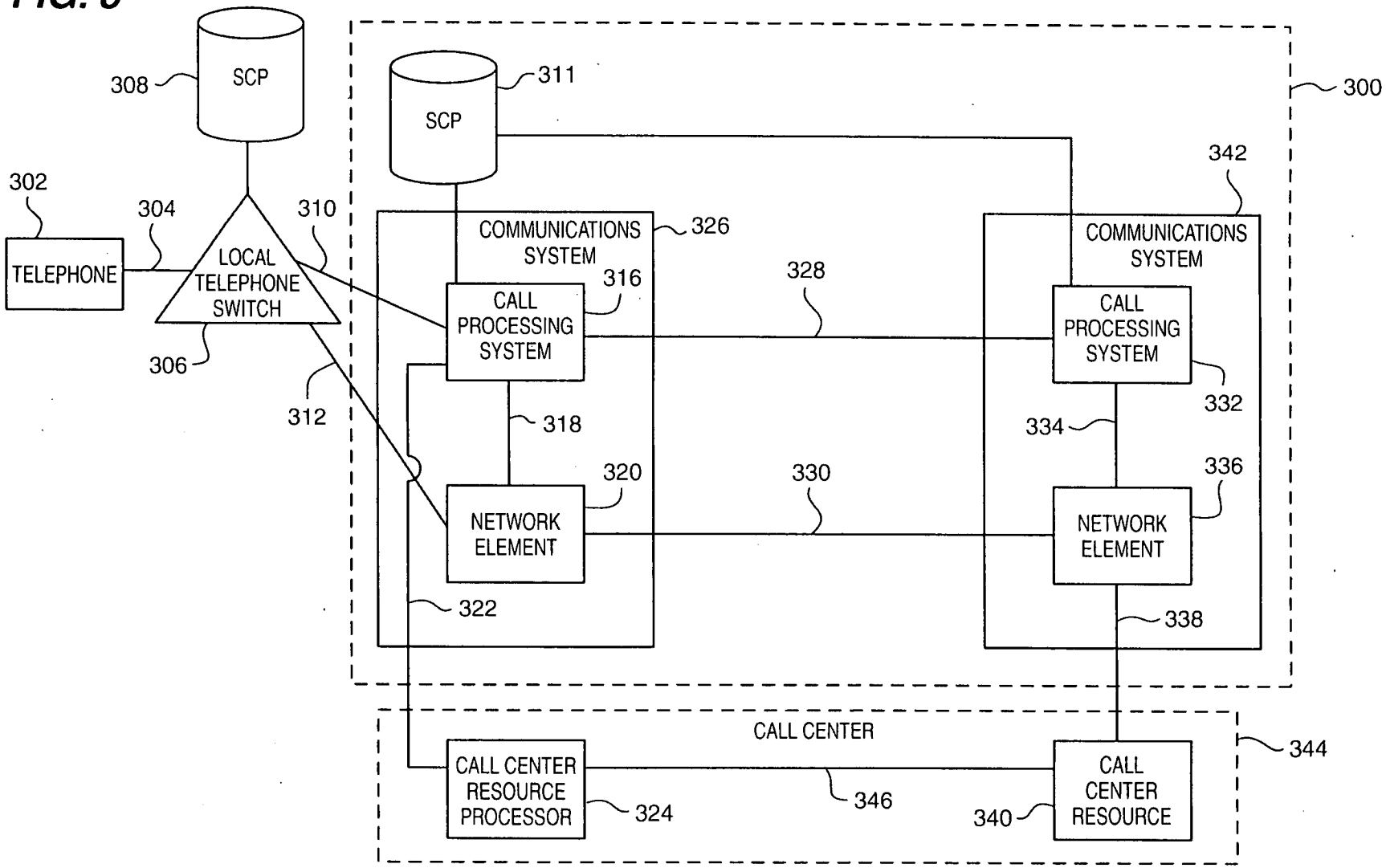

CALL PROCESSING SYSTEM 102
CALL CENTER RESOURCE PROCESSOR 122
NETWORK ELEMENT SYSTEM 104
CALL CENTER RESOURCE 124
INITIAL SIGNAL
ADDRESS QUERY
ADDRESS RESPONSE
ROUTE INST
DATA INST
SERVICE DATA
CALL
CALL
SERVICE DATA
RELEASE SIGNAL
RELEASE INSTR
CALL INFO
SERVICE DATA

FIG. 2

FIG. 3


SCP
308
SCP
311
300
302
304
310
TELEPHONE
LOCAL TELEPHONE SWITCH
306
312
COMMUNICATIONS SYSTEM
326
342
COMMUNICATIONS SYSTEM
316
328
CALL PROCESSING SYSTEM
CALL PROCESSING SYSTEM
332
318
334
320
330
336
NETWORK ELEMENT
NETWORK ELEMENT
322
338
CALL CENTER
344
CALL CENTER RESOURCE PROCESSOR
346
CALL CENTER RESOURCE
324
340

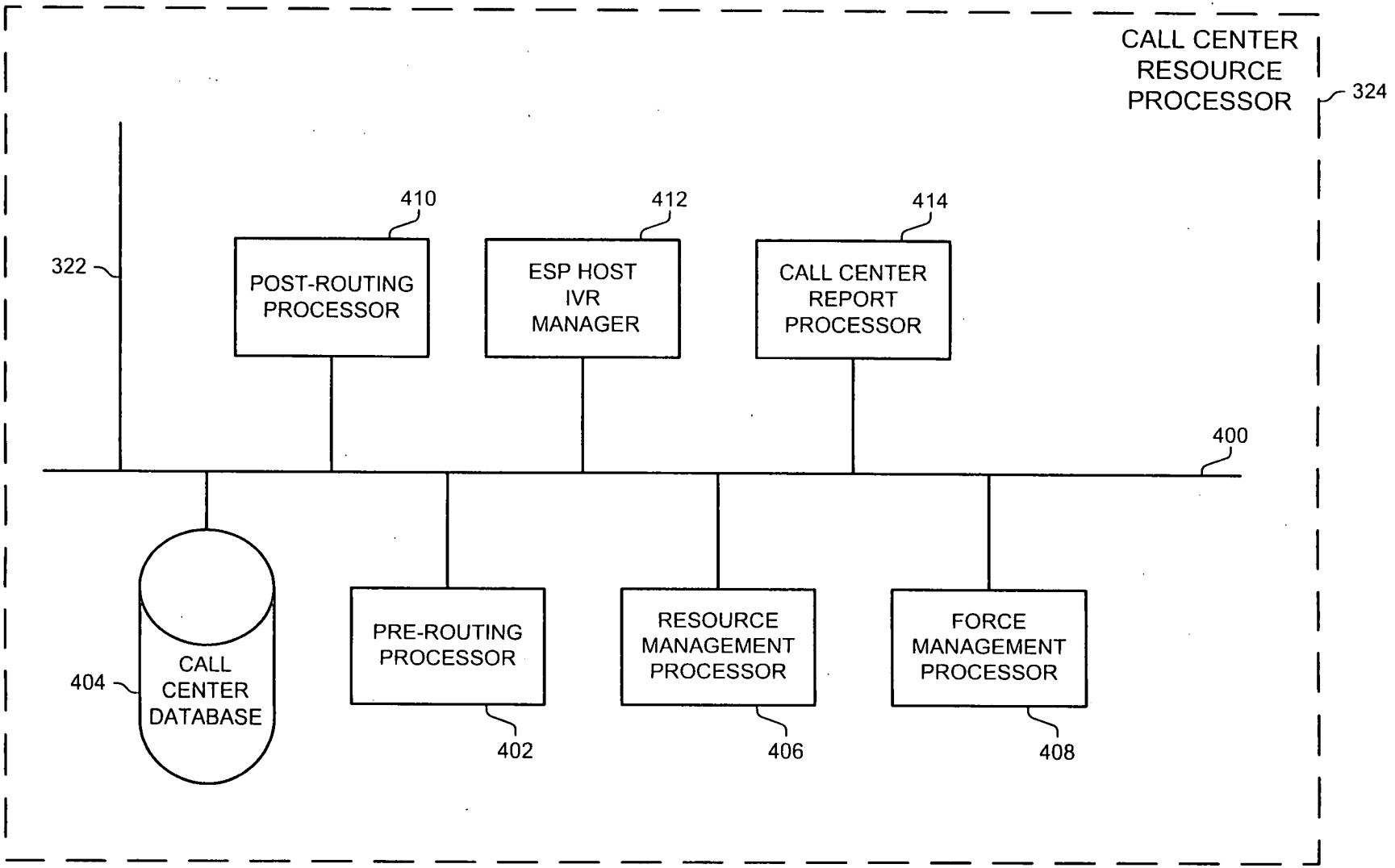
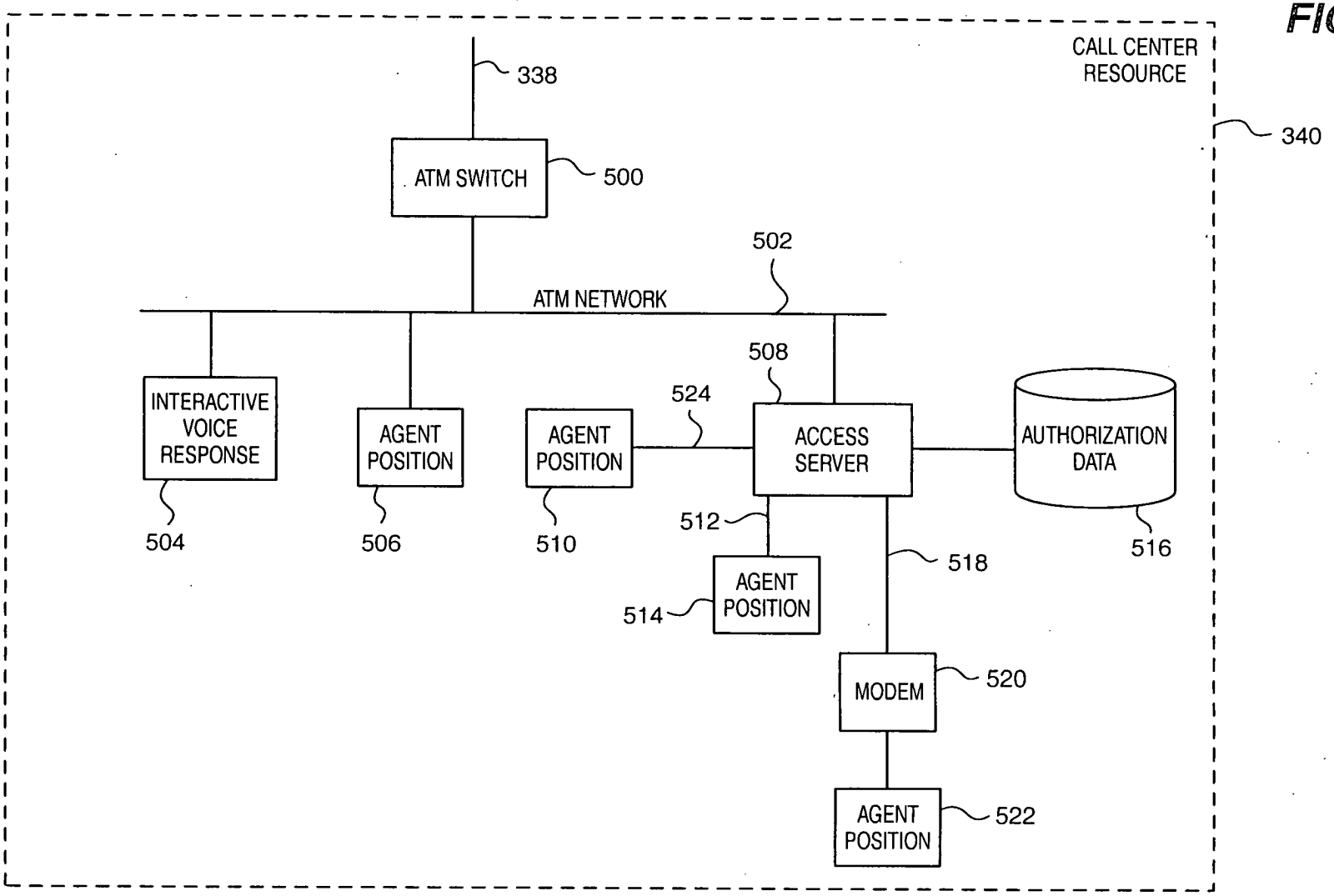

CALL CENTER RESOURCE PROCESSOR
324
322
410
POST-ROUTING PROCESSOR
412
ESP HOST IVR MANAGER
414
CALL CENTER REPORT PROCESSOR
400
404
CALL CENTER DATABASE
PRE-ROUTING PROCESSOR
402
RESOURCE MANAGEMENT PROCESSOR
406
FORCE MANAGEMENT PROCESSOR
408

FIG. 4

FIG. 5


CALL CENTER RESOURCE
340
338
ATM SWITCH
500
502
ATM NETWORK
508
INTERACTIVE VOICE RESPONSE
AGENT POSITION
AGENT POSITION
524
ACCESS SERVER
AUTHORIZATION DATA
504
506
510
512
516
518
AGENT POSITION
514
MODEM
520
AGENT POSITION
522

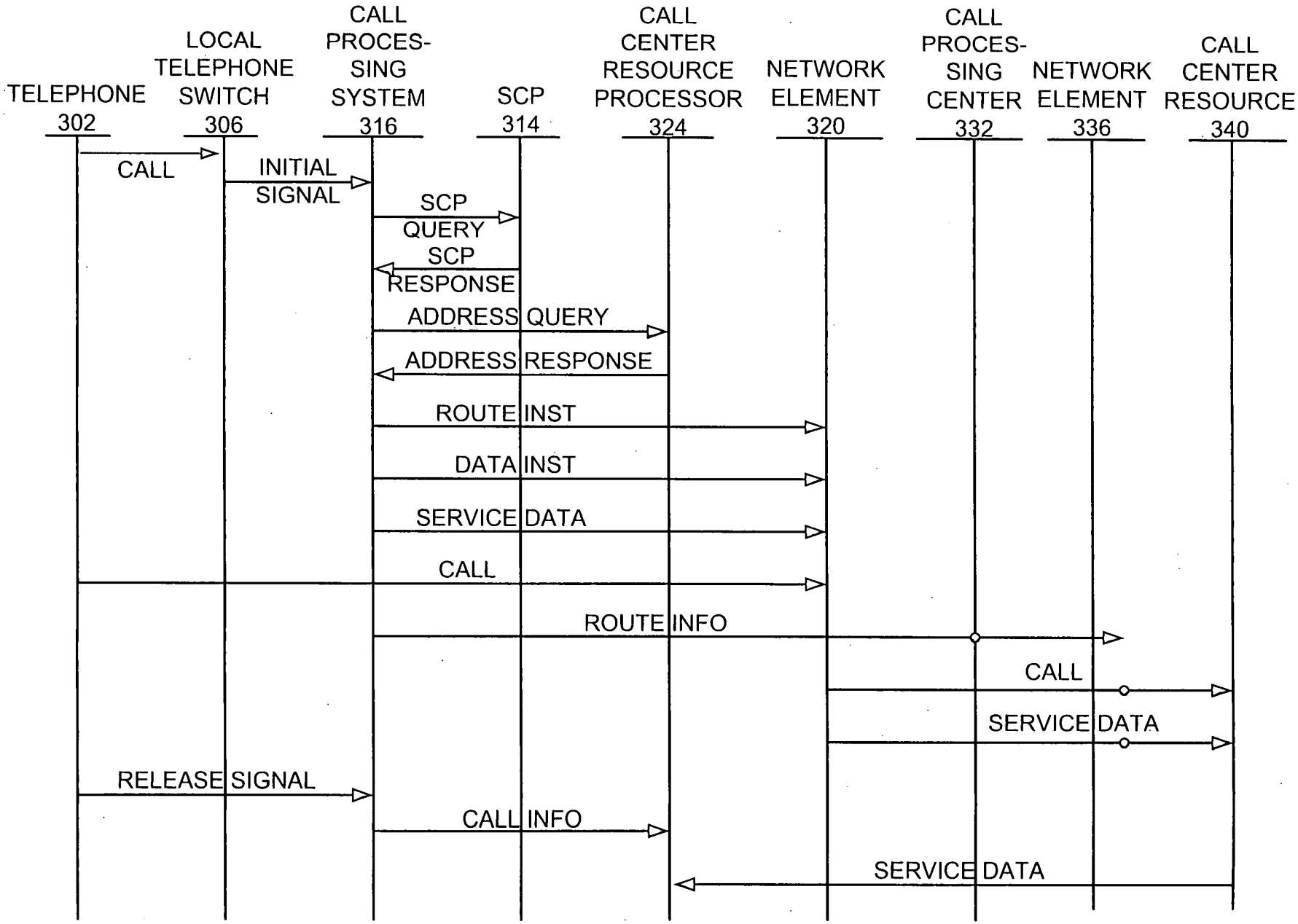

TELEPHONE
302
LOCAL TELEPHONE SWITCH
306
CALL PROCES-SING SYSTEM
316
SCP
314
CALL CENTER RESOURCE PROCESSOR
324
NETWORK ELEMENT
320
CALL PROCES-SING CENTER
332
NETWORK ELEMENT
336
CALL CENTER RESOURCE
340
CALL
INITIAL SIGNAL
SCP QUERY
SCP RESPONSE
ADDRESS QUERY
ADDRESS RESPONSE
ROUTE INST
DATA INST
SERVICE DATA
CALL
ROUTE INFO
CALL
SERVICE DATA
RELEASE SIGNAL
CALL INFO
SERVICE DATA

FIG. 6

FIG. 7A

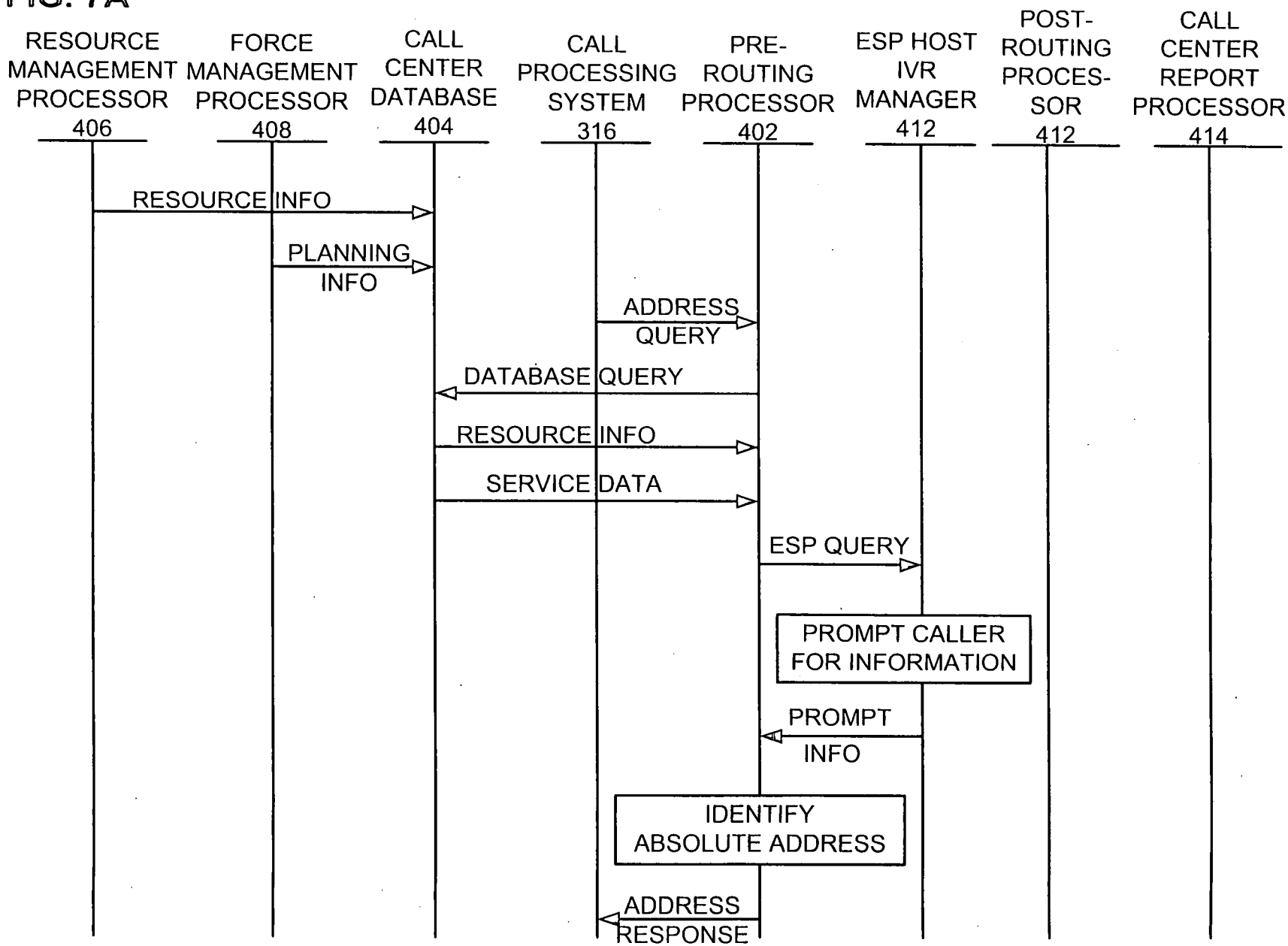

RESOURCE MANAGEMENT PROCESSOR 406
FORCE MANAGEMENT PROCESSOR 408
CALL CENTER DATABASE 404
CALL PROCESSING SYSTEM 316
PRE-ROUTING PROCESSOR 402
ESP HOST IVR MANAGER 412
POST-ROUTING PROCES-SOR 412
CALL CENTER REPORT PROCESSOR 414
RESOURCE INFO
PLANNING INFO
ADDRESS QUERY
DATABASE QUERY
RESOURCE INFO
SERVICE DATA
ESP QUERY
PROMPT CALLER FOR INFORMATION
PROMPT INFO
IDENTIFY ABSOLUTE ADDRESS
ADDRESS RESPONSE

FIG. 7B

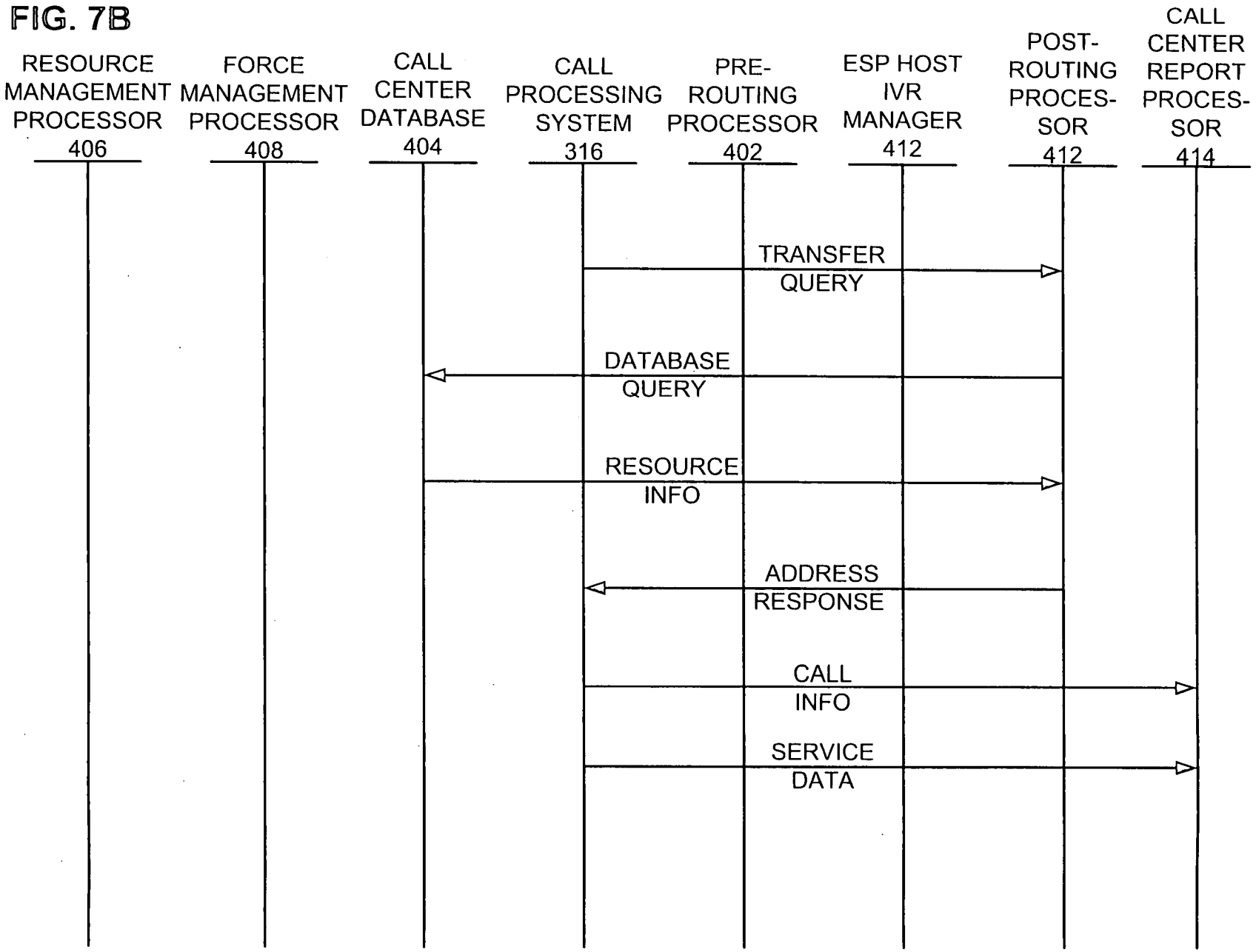
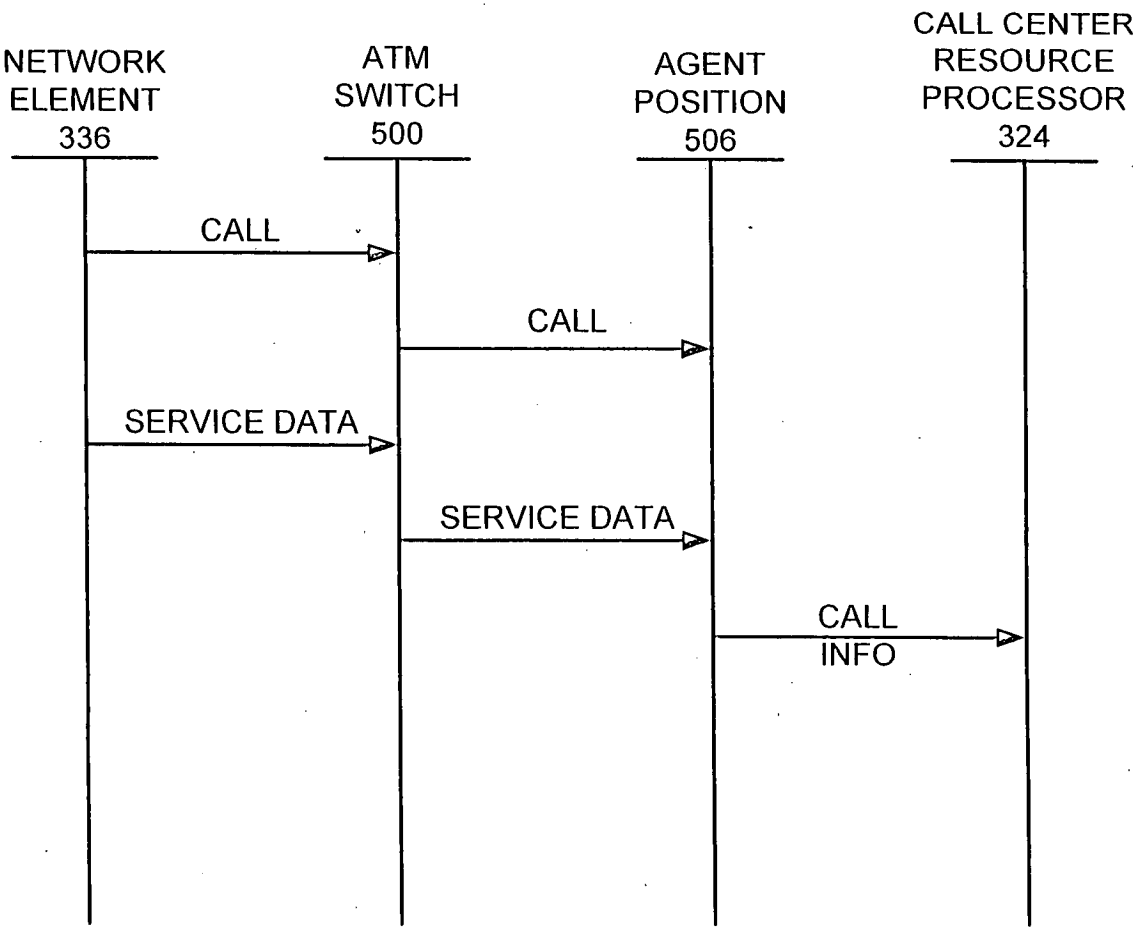

RESOURCE MANAGEMENT PROCESSOR 406
FORCE MANAGEMENT PROCESSOR 408
CALL CENTER DATABASE 404
CALL PROCESSING SYSTEM 316
PRE-ROUTING PROCESSOR 402
ESP HOST IVR MANAGER 412
POST-ROUTING PROCES-SOR 412
CALL CENTER REPORT PROCES-SOR 414
TRANSFER QUERY
DATABASE QUERY
RESOURCE INFO
ADDRESS RESPONSE
CALL INFO
SERVICE DATA

FIG. 8


NETWORK ELEMENT 336
ATM SWITCH 500
AGENT POSITION 506
CALL CENTER RESOURCE PROCESSOR 324
CALL
CALL
SERVICE DATA
SERVICE DATA
CALL INFO

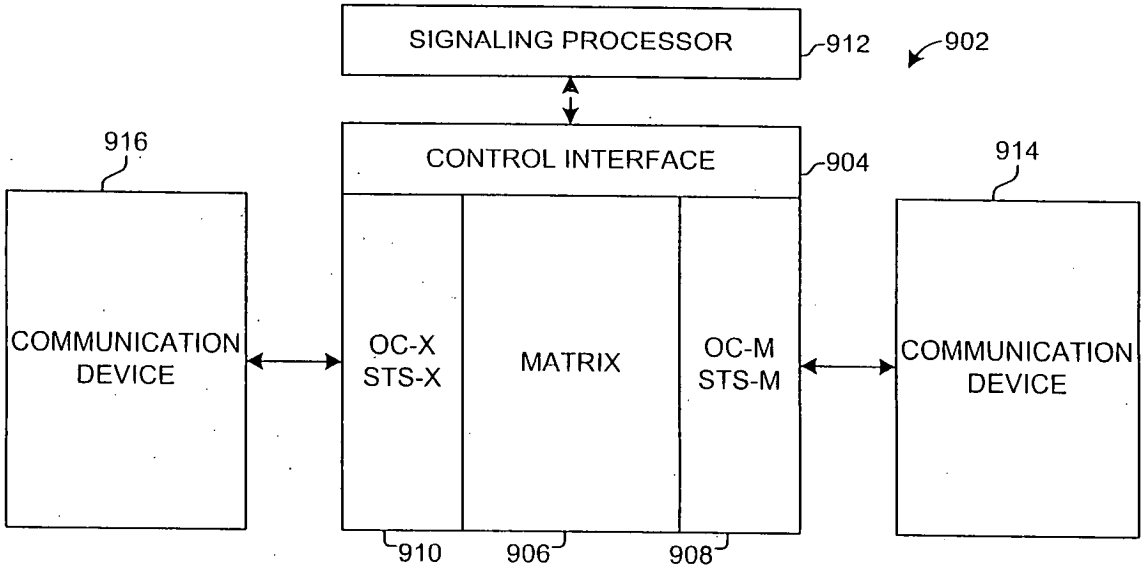

SIGNALING PROCESSOR
912
902
916
CONTROL INTERFACE
904
914
COMMUNICATION DEVICE
OC-X STS-X
MATRIX
OC-M STS-M
COMMUNICATION DEVICE
910
906
908

FIG. 9

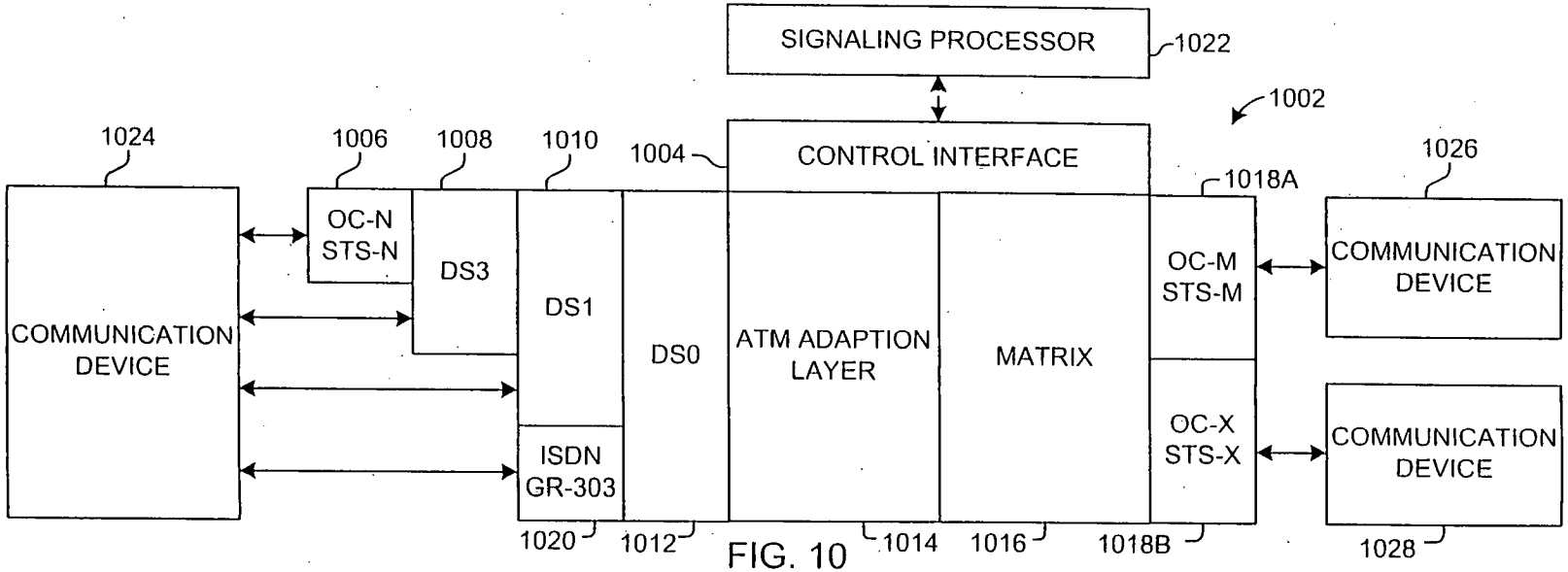

SIGNALING PROCESSOR
1022
1002
1024
1006
1008
1010
1004
CONTROL INTERFACE
1018A
1026
OC-N STS-N
DS3
DS1
DS0
ATM ADAPTION LAYER
MATRIX
OC-M STS-M
COMMUNICATION DEVICE
COMMUNICATION DEVICE
ISDN GR-303
OC-X STS-X
COMMUNICATION DEVICE
1020
1012
1014
1016
1018B
1028

FIG. 10

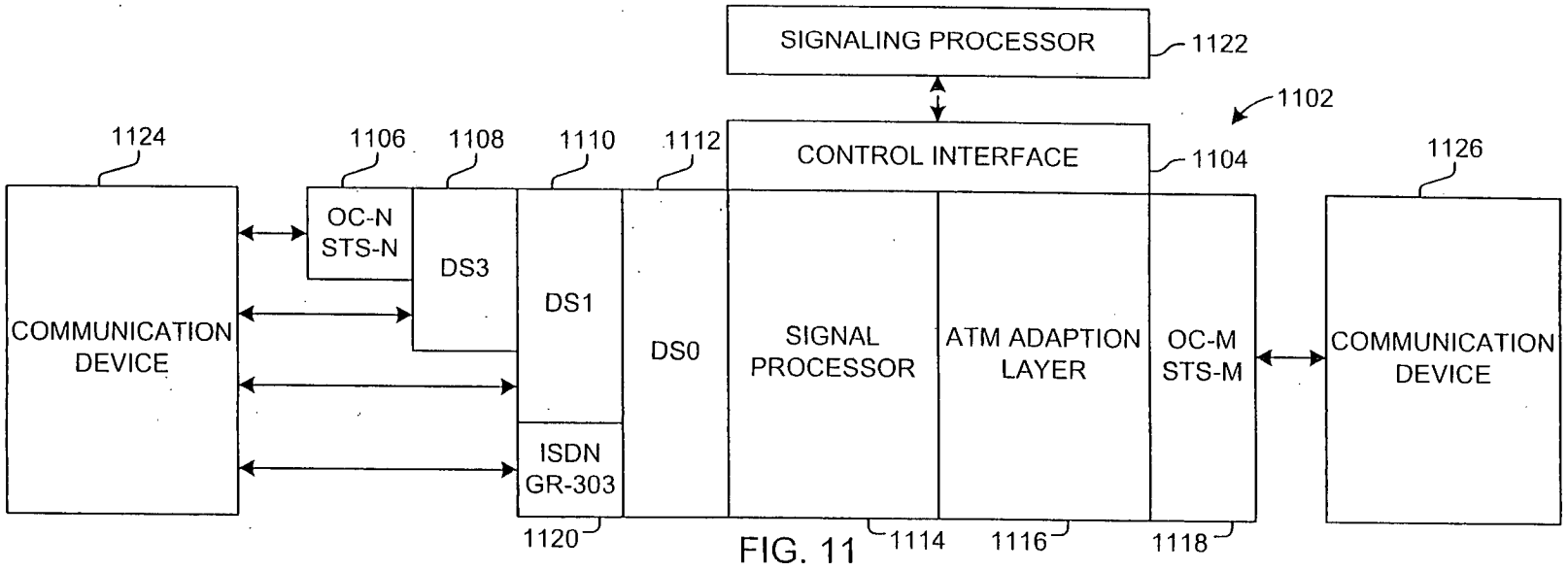

SIGNALING PROCESSOR
1122
1102
1124
1106
1108
1110
1112
CONTROL INTERFACE
1104
1126
OC-N
STS-N
DS3
DS1
DS0
SIGNAL
PROCESSOR
ATM ADAPTION
LAYER
OC-M
STS-M
COMMUNICATION
DEVICE
COMMUNICATION
DEVICE
ISDN
GR-303
1120
1114
1116
1118

FIG. 11

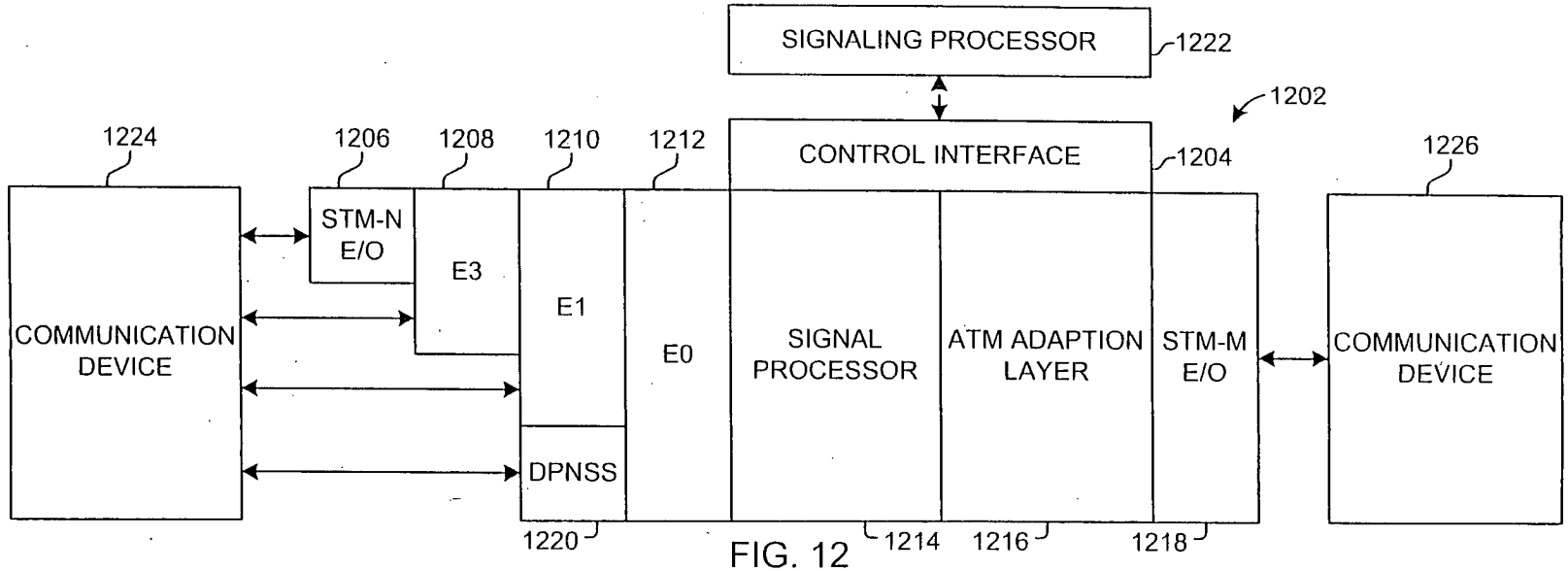

SIGNALING PROCESSOR
1222
1202
1224
1206
1208
1210
1212
CONTROL INTERFACE
1204
1226
STM-N
E/O
E3
E1
E0
SIGNAL
PROCESSOR
ATM ADAPTION
LAYER
STM-M
E/O
COMMUNICATION
DEVICE
COMMUNICATION
DEVICE
DPNSS
1220
1214
1216
1218

FIG. 12

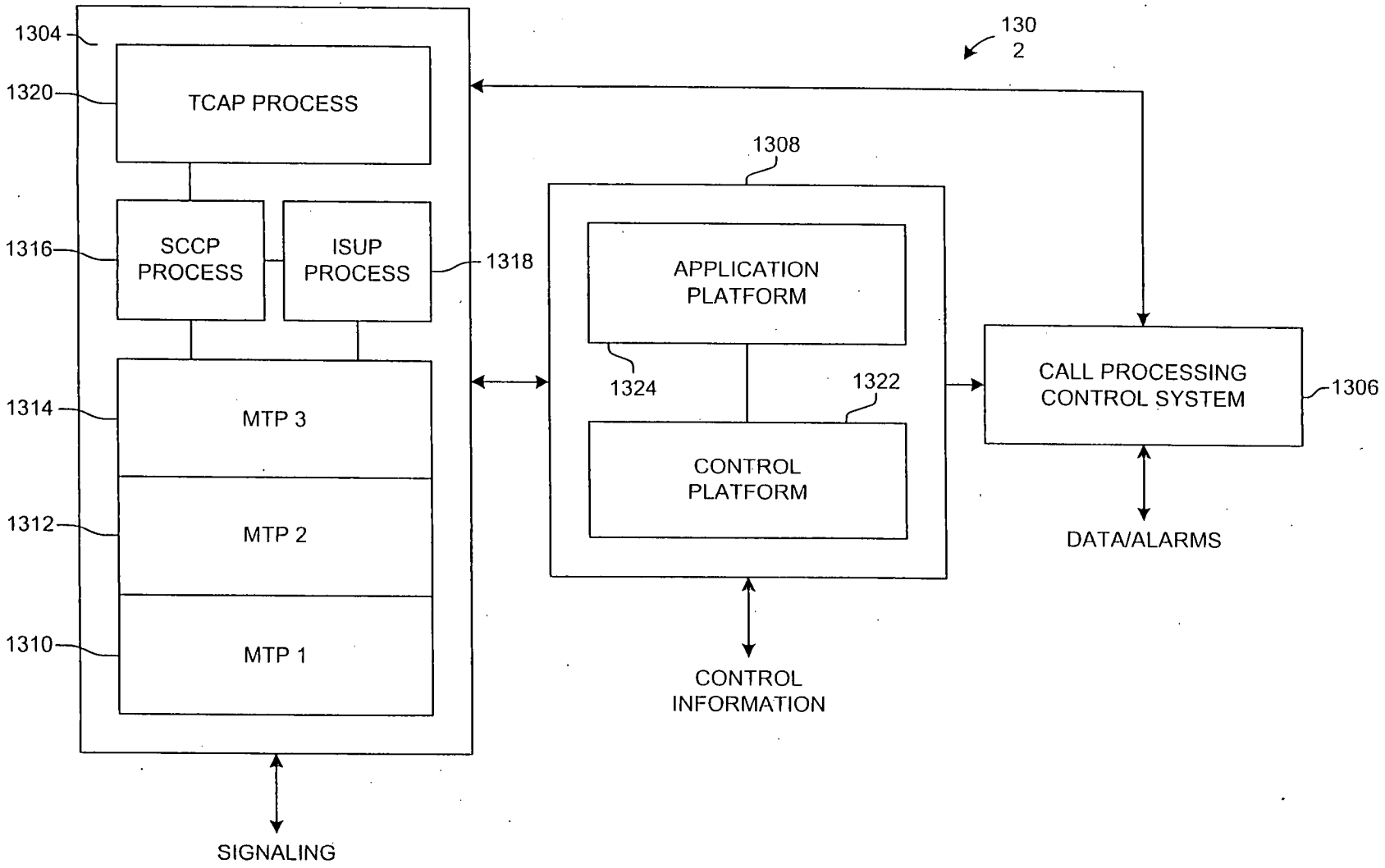

1304
1320
TCAP PROCESS
1316
SCCP PROCESS
ISUP PROCESS
1318
1314
MTP 3
1312
MTP 2
1310
MTP 1
SIGNALING
1302
1308
APPLICATION PLATFORM
1324
1322
CONTROL PLATFORM
CONTROL INFORMATION
CALL PROCESSING CONTROL SYSTEM
1306
DATA/ALARMS

FIG. 13

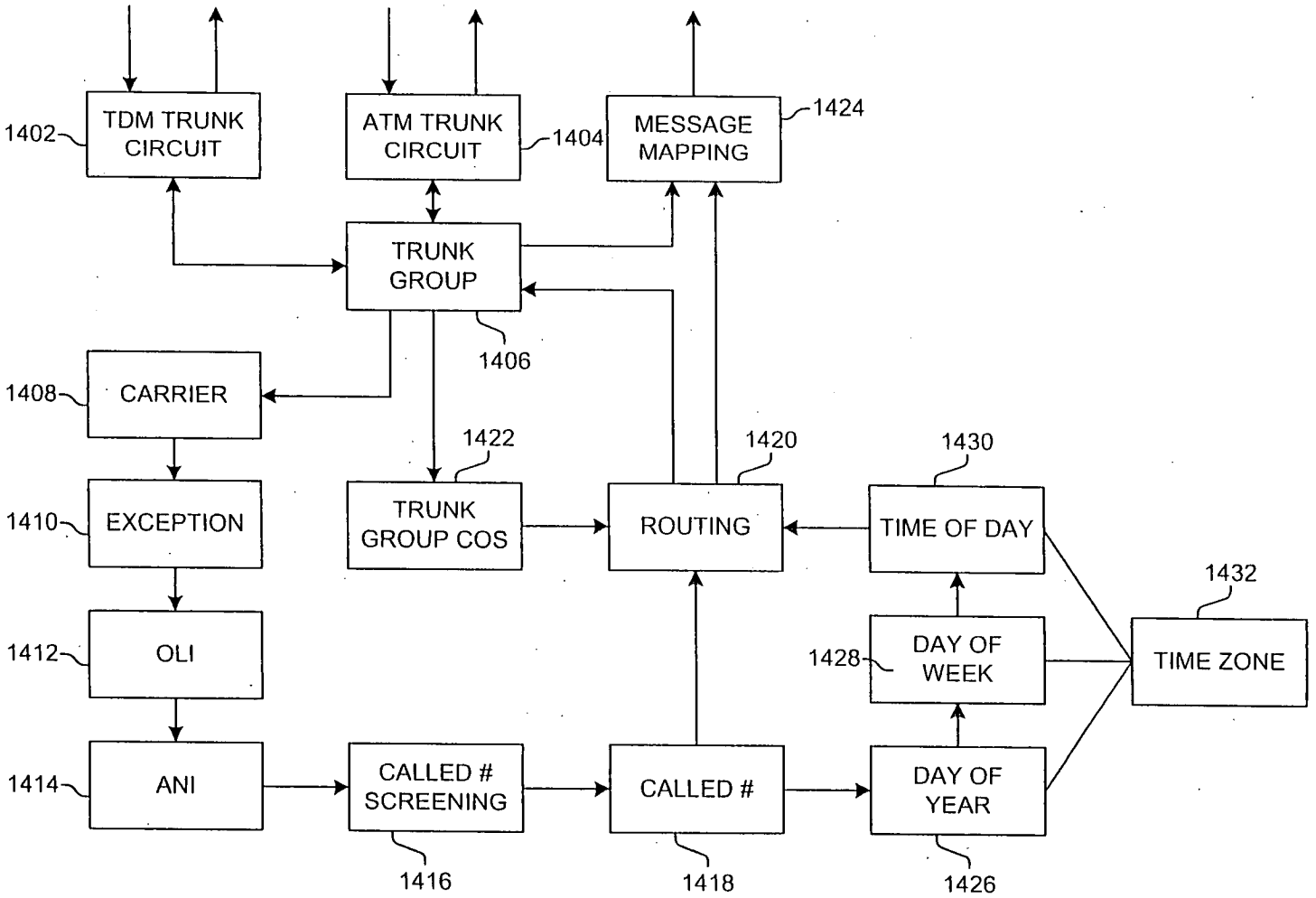

1402
TDM TRUNK CIRCUIT
ATM TRUNK CIRCUIT
1404
MESSAGE MAPPING
1424
TRUNK GROUP
1406
1408
CARRIER
1422
1420
1430
1410
EXCEPTION
TRUNK GROUP COS
ROUTING
TIME OF DAY
1432
1412
OLI
1428
DAY OF WEEK
TIME ZONE
1414
ANI
CALLED # SCREENING
CALLED #
DAY OF YEAR
1416
1418
1426

FIG. 14

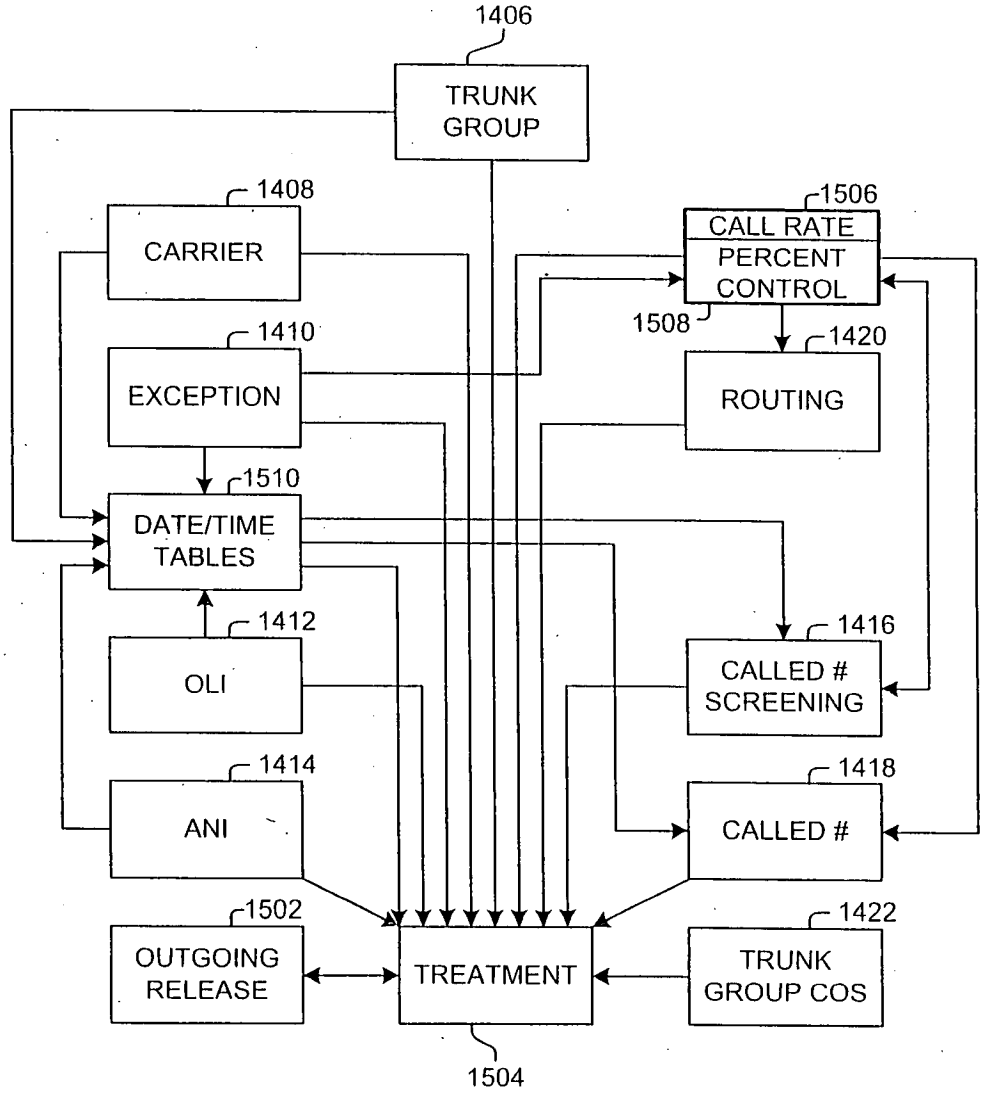

1406
TRUNK GROUP
1408
CARRIER
1506
CALL RATE PERCENT CONTROL
1508
1410
EXCEPTION
1420
ROUTING
1510
DATE/TIME TABLES
1412
OLI
1416
CALLED # SCREENING
1414
ANI
1418
CALLED #
1502
OUTGOING RELEASE
TREATMENT
1422
TRUNK GROUP COS
1504

FIG. 15

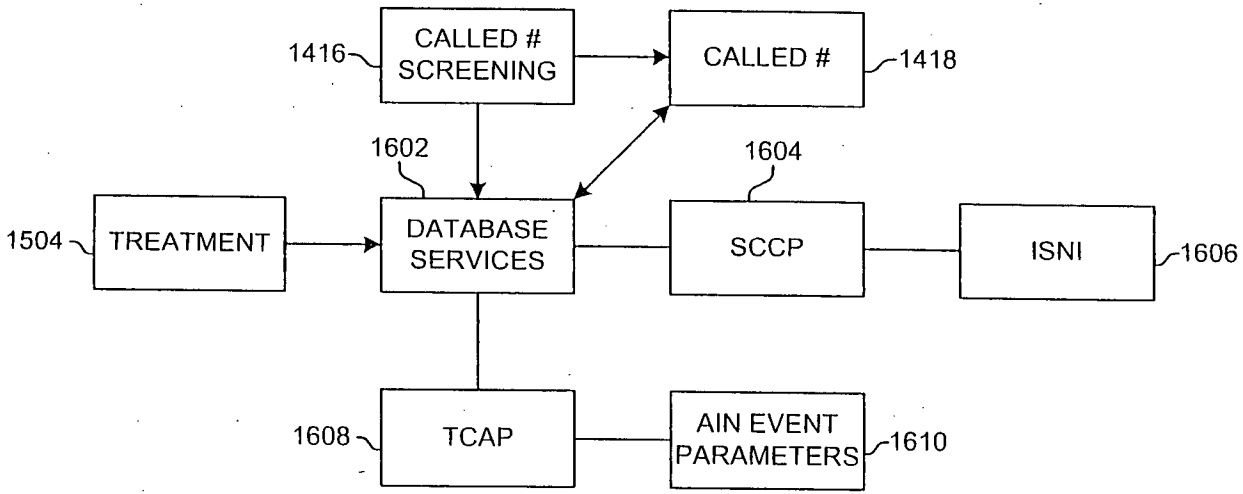

1416
CALLED # SCREENING
CALLED #
1418
1602
1604
1504
TREATMENT
DATABASE SERVICES
SCCP
ISNI
1606
1608
TCAP
AIN EVENT PARAMETERS
1610

FIG. 16

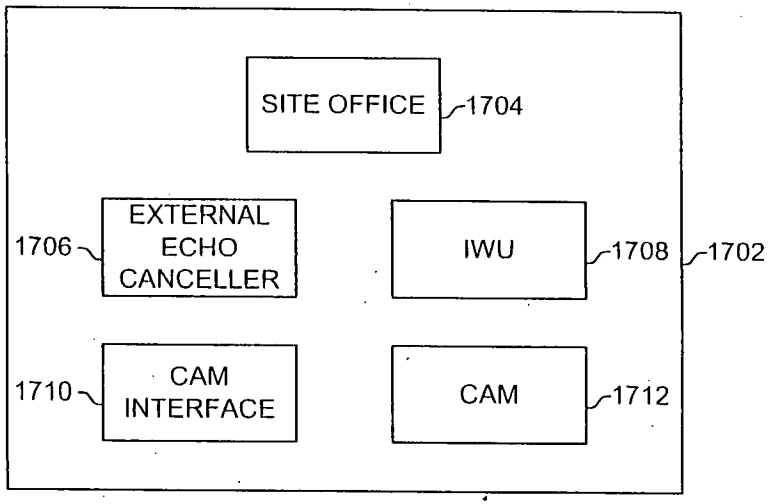

SITE OFFICE
1704
1706
EXTERNAL ECHO CANCELLER
IWU
1708
1702
1710
CAM INTERFACE
CAM
1712

FIG. 17

| TRUNK GROUP NUMBER | GROUP MEMBER | TCIC | EC LABEL | IWU LABEL | IWU PORT | DS1/E1 LABEL | DS1/E1 CHANNEL | INITIAL STATE |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |

FIG. 18

| TRUNK GROUP NUMBER | GROUP SIZE | STARTING CIC | TRANSMIT INTERFACE LABEL | TRANSMIT VPI | RECEIVE INTERFACE LABEL | RECEIVE VPI | INITIAL STATE |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |

FIG. 19

| TRUNK GROUP NUMBER | ADMIN INFORMATION | ASSOCIATED POINT CODE | CLLI | TRUNK TYPE | ASSOCIATED NPA | ASSOCIATED JIP | TIME ZONE LABEL | ECHO CANCELLER INFORMATION |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |

FIG. 20A

| SATELLITE | SELECT SEQUENCE | IWU PRIORITY | GLARE RESOLUTION | CONTINUITY CONTROL | REATTEMPTS | IGNORE LNP INFORMATION | TREATMENT LABEL | MESSAGE MAPPING LABEL |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |

FIG. 20B

| QUEUE | RING NO ANSWER | VOICE PATH CUT THROUGH | ORIGINATING COS LABEL | TERMINATING COS LABEL | CALL CONTROL | NEXT FUNCTION | NEXT LABEL |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |

FIG. 20C

| CARRIER LABEL | CARRIER ID | CARRIER SELECTION | NEXT FUNCTION | NEXT LABEL |
|---|---|---|---|---|
| | | | | |
| | | | | |

FIG. 21

| EXCEPTION LABEL | CALLING PARTY'S CATEGORY | CALLED NUMBER | | | NEXT FUNCTION | NEXT LABEL |
|---|---|---|---|---|---|---|
| | | NATURE OF ADDRESS | DIGITS FROM | DIGITS TO | | |
| | | | | | | |
| | | | | | | |

FIG. 22

| OLI LABEL | ORIGINATION LINE INFORMATION | NEXT FUNCTION | NEXT LABEL |
|---|---|---|---|
| | | | |
| | | | |

FIG. 23

| ANI LABEL | CHARGE CALLING PARTY NUMBER | | TIME ZONE LABEL | CUSTOMER INFORMATION | EC INFORMATION | QUEUE | TREATMENT LABEL | NEXT FUNCTION | NEXT LABEL |
|---|---|---|---|---|---|---|---|---|---|
| | DIGITS FROM | DIGITS TO | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

FIG. 24

| CALLED NUMBER SCREENING LABEL | CALLED NUMBER | | | DELETE DIGITS | NEXT FUNCTION | NEXT LABEL |
|---|---|---|---|---|---|---|
| | NATURE OF ADDRESS | DIGITS FROM | DIGITS TO | | | |
| | | | | | | |
| | | | | | | |

FIG. 25

| CALLED NUMBER LABEL | CALLED NUMBER | | | NEXT FUNCTION | NEXT LABEL |
|---|---|---|---|---|---|
| | NATURE OF ADDRESS | DIGITS FROM | DIGITS TO | | |
| | | | | | |
| | | | | | |

FIG. 26

| DAY OF YEAR LABEL | DATE | NEXT FUNCTION | NEXT LABEL |
|---|---|---|---|
| | | | |
| | | | |

FIG. 27

| DAY OF WEEK | DAY FROM | DAY TO | NEXT FUNCTION | NEXT LABEL |
|---|---|---|---|---|
| | | | | |
| | | | | |

FIG. 28

| TIME OF DAY LABEL | TIME FROM | TIME TO | NEXT FUNCTION | NEXT LABEL |
|---|---|---|---|---|
| | | | | |
| | | | | |

FIG. 29

| TIME ZONE LABEL | UTC OFFSET | DAYLIGHT SAVINGS |
|---|---|---|
| | | |
| | | |

FIG. 30

| ROUTING LABEL | ROUTE NUMBER | NEXT FUNCTION | NEXT LABEL | SIGNAL ROUTE LABEL |
|---|---|---|---|---|
| | | | | |
| | | | | |

FIG. 31

| ORIGINATING TRUNK COS LABEL | TERMINATING TRUNK COS LABEL | NEXT FUNCTION | NEXT LABEL |
|---|---|---|---|
| | | | |
| | | | |

FIG. 32

| TREATMENT LABEL | ERROR/CAUSE LABEL | NEXT FUNCTION | NEXT LABEL |
|---|---|---|---|
| | | | |
| | | | |

FIG. 33

| OUTGOING RELEASE LABEL | OUTGOING CAUSE VALUE | | |
|---|---|---|---|
| | LOCATION | CODING STANDARD | CAUSE VALUE |
| | | | |
| | | | |

FIG. 34

| PERCENT LABEL | CONTROL PERCENTAGE | CONTROL | | PASSED | |
|---|---|---|---|---|---|
| | | NEXT FUNCTION | NEXT LABEL | NEXT FUNCTION | NEXT LABEL |
| | | | | | |
| | | | | | |

FIG. 35

| CALL RATE LABEL | CALL RATE | CONTROL | | PASSED | |
|---|---|---|---|---|---|
| | | NEXT FUNCTION | NEXT LABEL | NEXT FUNCTION | NEXT LABEL |
| | | | | | |
| | | | | | |

FIG. 36

| DATABASE SERVICES LABEL | SERVICE TYPE | SCCP LABEL | TCAP LABEL | NEXT FUNCTION | NEXT LABEL |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

FIG. 37

| SCCP LABEL | MESSAGE TYPE | PROTOCOL CLASS | MESSAGE HANDLING | HOP COUNTER | SEGMENTATION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

FIG. 38A

| ISNI | | | |
|---|---|---|---|
| ISNI TYPE | ROUTE INDICATOR | MARK INDICATOR | LABEL |
| | | | |
| | | | |

FIG. 38B

| CALLED PARTY ADDRESS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ADDRESS INDICATOR | | | | | SUB | POINT | GLOBAL TITLE | | | |
| SSN | POINT CODE | GLOBAL TITLE INDICATOR | ROUTING INDICATOR | NATIONAL/ INTERNATIONAL | SYSTEM NUMBER | CODE NUMBER | TRANSLATION TYPE | ENCODE SCHEME | NUMBER PLAN | ADDRESS TYPE |
| | | | | | | | | | | |
| | | | | | | | | | | |

FIG. 38C

| CALLING PARTY ADDRESS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ADDRESS INDICATOR | | | | | SUB SYSTEM NUMBER | POINT CODE NUMBER | GLOBAL TITLE | | | |
| SSN | POINT CODE | GLOBAL TITLE INDICATOR | ROUTING INDICATOR | NATIONAL/ INTERNATIONAL | | | TRANSLATION TYPE | ENCODE SCHEME | NUMBER PLAN | ADDRESS TYPE |
| | | | | | | | | | | |
| | | | | | | | | | | |

FIG. 38D

| ISNI LABEL | NETWORK 1 | NETWORK 2 | NETWORK 3 | NETWORK . . . | NETWORK 16 |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

FIG. 39

| TCAP LABEL | TCAP TYPE | TAG CLASS | PACKAGE TYPE | COMPONENT TYPE | MESSAGE TYPE |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

FIG. 40

| ECHO CANCELLER LABEL | ECHO CANCELLER TYPE | RS-232 ADDRESS | MODULE |
|---|---|---|---|
| | | | |
| | | | |

FIG. 41

| IWU LABEL | IWU ID | IP SOCKET 1 | IP SOCKET 2 | IP SOCKET 3 | IP SOCKET 4 |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

FIG. 42

| CAM INTERFACE LABEL | CAM LABEL | LOGICAL INTERFACE |
|---|---|---|
| | | |
| | | |

FIG. 43

| CAM LABEL | CAM TYPE | CAM ADDRESS |
|---|---|---|
| | | |
| | | |

FIG. 44

| OFFICE CLLI NAME | SITE NODE ID | ORIGINATION ID | SOFTWARE ID | CALL PROCESSOR ID |
|---|---|---|---|---|
| | | | | |
| | | | | |

FIG. 45A

| ACC ENABLED | ACL 1 ONSET | ACL 1 ABATE | ACL 2 ONSET | ACL 2 ABATE | ACL 3 ONSET | ACL 3 ABATE |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |

FIG. 45B

| MAX TRUNKS OHQ | OHQ TQ1 | OHQ TQ2 | RING NO ANSWER TIMER | BILLING ACTIVE | NWM ALLOW | BILLING FAILURE FREE CALL |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |

FIG. 45C

| MAX HOP COUNTS | MAX TABLE LOOKUPS |
|---|---|
| | |
| | |

FIG. 45D

| AIN EVENT PARAMETERS LABEL | MESSAGE NAME #1 | MESSAGE NAME #.... | MESSAGE NAME #N |
|---|---|---|---|
| ACCESS CODE | | | |
| ACG ENCOUNTERED | | | |
| ALTERNATE BILLING INDICATOR | | | |
| ALTERNATE TRUNK GROUP | | | |
| AMA ALTERNATE BILLING NUMBER | | | |
| AMA BUSINESS CUSTOMER ID | | | |
| AMA DIGITS DIALED WC | | | |
| AMA LINE NUMBER | | | |
| AMA SLPID | | | |
| AMP | | | |
| ANSWER INDICATOR | | | |
| BEARER CAPABILITY | | | |
| BUSY CAUSE | | | |
| CALLED PARTY ID | | | |
| CALLED PARTY STATION TYPE | | | |
| CALLING PARTY BGID | | | |
| CARRIER | | | |
| CHARGE NUMBER | | | |
| CHARGE PARTY STATION TYPE | | | |
| CLEAR CAUSE | | | |
| COLLECTED ADDRESS INFORMATION | | | |
| COLLECTED DIGITS | | | |
| CONTROLLING LEG TREATMENT | | | |
| DISCONNECT FLAG | | | |
| DISPLAY TEXT | | | |
| FACILITY GID (TRUNK GROUP ID) | | | |
| FACILITY GID (PRIVATE FACILITY GID) | | | |
| FACILITY GID (ROUTE INDEX) | | | |
| FACILITY MEMBER ID | | | |
| FAILURE CAUSE | | | |
| GENERIC NAME | | | |
| ISDN INTERFACE ID | | | |
| LATA | | | |
| ORIGINAL CALLED PARTY ID | | | |
| OUTPULSE NUMBER | | | |
| OVERFLOW BILLING NUMBER | | | |
| PASSIVE LEG TREATMENT | | | |
| PRIMARY BILLING INDICATOR | | | |
| PRIMARY CARRIER | | | |
| PRIMARY TRUNK GROUP | | | |
| REDIRECTING PARTY ID | | | |
| REDIRECTION INFORMATION | | | |
| RESOURCE TYPE | | | |
| SECOND ALTERNATE BILLING INDICATOR | | | |
| SECOND ALTERNATE CARRIER | | | |
| SECOND ALTERNATE TRUNK GROUP | | | |
| SPID | | | |
| STR PARAMETER BLOCK | | | |

FIG. 46A

| AIN EVENT PARAMETERS LABEL | MESSAGE NAME #1 | MESSAGE NAME #.... | MESSAGE NAME #N |
|---|---|---|---|
| TCM | | | |
| TRIGGER CRITERIA TYPE | | | |
| USER ID | | | |
| VERTICAL SERVICE CODE | | | |
| APPLICATION ERROR STRING | | | |
| ERROR CAUSE | | | |
| FAILED MESSAGE | | | |
| CONNECT TIME | | | |
| CONTROL CAUSE INDICATOR | | | |
| ECHO DATA | | | |
| FACILITY STATUS | | | |
| GAP DURATION | | | |
| GAP INTERVAL (NATIONAL GAP INTERVAL) | | | |
| GAP INTERVAL (PRIVATE GAP INTERVAL) | | | |
| GLOBAL TITLE VALUE | | | |
| MONITOR TIME | | | |
| STATUS CAUSE | | | |
| TERMINATION INDICATOR | | | |
| TRANSLATION TYPE | | | |
| TRIGGER CRITERIA FLAG | | | |

FIG. 46B

| MESSAGE TYPE | PARAMETERS | INDEX #1 | INDEX #.... | INDEX #N |
|---|---|---|---|---|
| ADDRESS COMPLETE | BACKWARD CALL INDICATOR | | | |
| | ACCESS TRANSPORT | | | |
| | CAUSE INDICATOR | | | |
| | PRIVATE OPTIONAL | | | |
| ANSWER | ACCESS TRANSPORT | | | |
| | BACKWARD CALL INDICATOR | | | |
| | PRIVATE OPTIONAL | | | |
| CALL PROGRESS | NOTIFICATION | | | |
| | BACKWARD CALL INDICATOR | | | |
| | ACCESS TRANSPORT | | | |
| | CAUSE INDICATOR | | | |
| | BACKWARD CALL INDICATOR | | | |
| CIRCUIT VALIDATION RESPONSE MESSAGE | CIRCUIT ID NAME | | | |
| | CLLI CODE | | | |
| CONTINUITY | CONTINUITY INDICATOR | | | |
| EXIT | DISPOSITION | | | |
| | TRUNK GROUP NUMBER | | | |
| | SEND BACK EXIT MESSAGE | | | |
| INITIAL ADDRESS | FORWARD CALL INDICATOR | | | |
| | CALLING PARTY'S CATEGORY | | | |
| | GENERIC ADDRESS PARAMETER (LNP) | | | |
| | CALLED PARTY NUMBER | | | |
| | CALLING PARTY NUMBER | | | |
| | GENERIC DIGITS | | | |
| | CHARGE NUMBER | | | |
| | ORIGINATING LINE INFORMATION | | | |
| | TRANSIT NETWORK SELECTION | | | |
| | CARRIER SELECTION INFORMATION | | | |
| | ORIGINATING LINE INFORMATION | | | |
| | SERVICE CODE | | | |
| | CARRIER IDENTIFICATION | | | |
| | ORIGINAL CALLED NUMBER | | | |
| | REDIRECTING NUMBER | | | |
| | REDIRECTION INFORMATION | | | |
| | GENERIC ADDRESS (NON-LNP) | | | |
| | ACCESS TRANSPORT | | | |
| | HOP COUNTER | | | |
| | JURISDICTION INFORMATION | | | |
| RELEASE | ACCESS TRANSPORT | | | |
| | AUTOMATIC CONGESTION CONTROL | | | |

FIG. 47